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CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

50X1-HUM

COUNTRY USSR

SUBJECT Scientific - Electricity, instruments

DATE OF INFORMATION 1950

HOW PUBLISHED Monthly periodical

DATE DIST. 4 Dec 1950

WHERE PUBLISHED Moscow

NO. OF PAGES 3

DATE PUBLISHED Sep 1950

LANGUAGE Russian

SUPPLEMENT TO REPORT NO.

THIS IS UNEVALUATED INFORMATION

SOURCE Elektrichestvo, No 9, 1950.

CONTROL MEASURING INSTRUMENTS

Compiled by Engr R. Ye. Gel'man

The following types of control measuring instruments, listed on sheet 57 of the Handbook of Power Plant Engineering, are manufactured by the Ministry of Machine and Instrument Building USSR:

ENM -- Electromagnetic ammeters, ordinary. With magnetic damping, for 50 cycle ac circuits. Accuracy class 2.5 [percent]. Maximum readings: (a) for direct connection, 1, 2, 3, 5, 10, 20, 30, 50, 75, 100, 150 and 200 amp; (b) for use with current transformers, 7.5, 10, 15, 20, 30, 40, 50, 75, 100, 150, 200, 300, 400, 600, 750, 1,000, 1,500, 2,000, 3,000, 4,000, 5,000, 6,000, 7,500, 10,000, and 15,000 amp. Frame diameter 185 mm, height 75 mm (frame) plus 52 mm (current-carrying leads). Weight 1.33 kg.

EMM -- Electromagnetic ammeters, small. The same as Type ENM ammeters except that ammeters with maximum readings of 100, 150, and 200 amp for direct connection are not made. Frame diameter 135 mm, height 73 mm (frame) plus 52 mm (current-carrying leads). Weight 0.8 kg.

MN -- Magnetoelectric ammeters, ordinary. For use in dc circuits. Accuracy class 1.5. Maximum readings: (a) with internal shunt, 1, 2, 3, 5, 10, 20, 30, 50, 75, 76, and 100 amp; (b) with shunt connected across calibrated leads, 150, 200, 300, 500, 750, 760, 1,000, 1,500, 2,000, 3,000, 4,000, and 5,000 amp. Instrument scales have zero reading on left or in center. Frame diameter 185 mm, height 75 mm (frame) plus 52 mm (current-carrying leads). Weight 1.6 kg.

MM -- Magnetoelectric ammeters, small. For use in dc circuits. Accuracy class 1.5. Maximum readings: (a) with internal shunt, 0.05, 0.075, 0.076, 0.1, 0.15, 0.3, 0.5, 1, 2, 3, 5, 10, 20, 30, and 50 amp; (b) with shunt connected across calibrated leads, 75, 76, 100, 150, 200, 300, and 500 amp. Instrument scales have zero reading on left or in center. Frame diameter 135 mm, height 73 mm (frame) plus 52 mm (current-carrying leads). Weight 1.1 kg.

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2MU -- Magnetoelectric ammeters, very small. For use in dc circuits. Accuracy class 1.5. Maximum readings: (a) with internal shunt, 0.05, 0.075, 0.076, 0.1, 0.15, 0.3, 0.5, 1, 2, 3, 5, and 10 amp; (b) with shunt connected across calibrated leads, 20, 30, 50, 75, 76, 100, 150, 200, and 300 amp. Instrument scales have zero reading on left or in center. Frame diameter 110 mm, height 66 mm (frame) plus 58 mm (current-carrying leads). Weight 0.9 kg.

ENM -- Electromagnetic voltmeters, ordinary. With magnetic damping, for use with 50 cycle ac circuits. Accuracy class 2.5. Maximum readings: (a) for direct connection, 15, 30, 50, 150, 250, 460, and 600 v; (b) for use with voltage transformers, 3,600, 7,500, 12,000, 18,000 and 42,000 v. Dimensions and weight as for Type ENM ammeters (see above).

EMM -- Electromagnetic voltmeters, small. For use with 50 cycle ac circuits. Accuracy class 2.5. Maximum readings: (a) for direct connection, 15, 30, 50, 150, and 250 v; (b) for use with voltage transformers, 460, 600, 3,600, 7,500, 12,0000, 18,000, and 42,000 v. Dimensions and weight as for Type EMM ammeters (see above).

MN -- Magnetoelectric voltmeters, ordinary. For use with dc circuits. Accuracy class 1.0. Maximum readings: (a) with supplementary internal resistor, 3, 7.5, 7.6, 15, 30, 50, 75, 76, 150, 250, 300, 450, 460, and 600 v; (b) with Type VDS external resistor, 1,000, 1,500, and 3,000 v. Instrument scales have zero reading on left or in center. Resistance of instrument 133 ohms/volt. Dimensions and weight as for Type MN ammeters (see above).

MM -- Magnetoelectric voltmeters, small. For use with dc circuits. Accuracy class 1.0. Maximum readings: (a) with internal resistor, 3, 7.5, 7.6, 15, 30, 50, 75, 76, 150, 250, and 300 v; (b) with Type 1SD1 external resitor, 450, 460, and 600 v; (c) with Type VDS external resistor, 1,000, 1,500, and 3,000 v. Instrument scales have zero reading on left or in center. Resistance of instrument 133 ohms/volt. Dimensions and weight as for Type MM ammeters (see above).

2MU -- Magnetoelectric voltmeters, very small. For use with dc circuits. Accuracy class 1.0. Maximum readings: (a) (2) with internal resistor, 3, 7.5, 7.6, 15, 30, 50, 75, 76, and 150 v; (b) with Type 1SD1 external resistor, 250, 300, 450, and 600 v; (c) with Type VDS external resistor, 1,000 and 1,500 v. Instrument scales have zero reading on left or in center. Resistance of instrument 133 ohms/volt. Dimensions and weight as for Type 2MU ammeters (see above).

VIT -- Induction wattmeters. For use with three-phase ac circuits with unbalanced phase loading. Accuracy class 2.5. Can be connected directly in 127, 220, and 380-v circuits or through voltage transformers in 500, 3,000, 6,000, 10,000, 15,000, and 35,000-v circuits. Current rating 5 amp. Frame diameter 225 mm, frame height 147 mm. Weight 5.2 kg.

VIN -- Induction wattmeters. For use with three-phase ac circuits with balanced phase loading, the generator windings being connected by a star connection with the neutral point brought out. Accuracy class 2.5. Can be connected directly in 220 and 380-v circuits and through voltage transformers in 3,000, 6,000, 15,000, and 35,000-v circuits. Current rating 5 amp. Dimensions and weight as for Type VIT wattmeters (see above).

VIO -- Induction wattmeters. For use with single-phase ac circuits. Characteristics and dimensions as for Type VIT wattmeters (see above). Weight 4.3 kg.

FVT -- Ferrodynamic wattmeters. Will come into use in the second half of 1950. Fixed, for three-phase ac circuits with unbalanced phase loading. Accuracy class 2.5. Can be connected directly in 100, 220, and 380-v circuits and through voltage transformers in 380, 500, 3,000, 6,000, 10,000, 15,000, and 35,000-v circuits. Current rating 5 amp. Frame diameter 185 mm, height 95 mm (frame) plus 52 mm (current-carrying leads).

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